# PATENT ABSTRACTS OF JAPAN

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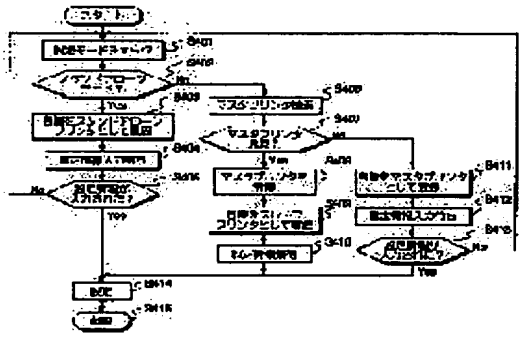
## (54) PRINTER

(57)Abstract:
PROBLEM TO BE SOLVED: To simplify processes for inputting and updating the set information of a printer to be connected to a network.
SOLUTION: When a master device to be the update source of setting information required for executing the job of the printer is detected, the set information is received from the master device through the network, and a set information storage means stores the set information received under the control of a storage control means. Thus, when connecting the plural printers to the network, only by setting the first printer connected to the network as the master device, initial setting can be automatically performed concerning the printer after the second printer only by connecting it to the network and turning on a power source and the load on a user and a service engineer for installation can be saved so that the job can be easily executed.



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CLAIMS

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[Claim(s)]
[Claim 1] A detection means to be the printer to which two or more equipments are connected through a network, and to detect whether the master unit which becomes the renewal origin of setting information required for activation of the job of said printer is connected through said network, A receiving means to receive setting information from said master unit when said master unit is detected based on the result of said detection, The printer characterized by having a setting information storage means to memorize said setting information, a storage control means to make said setting information storage means memorize said setting information, and a job activation means to perform said job based on said setting information.
[Claim 2] The printer characterized by to have a decision means determine the printer concerned in a printer according to claim 1 as a master unit which becomes the renewal origin of said setting information when said master unit is not detected based on the result of said detection, and the generation storage control means which generate said setting information that it should function as said master unit based on said decision, and said setting information-storage means is made to memorize.
[Claim 3] It is the printer which has a modification receiving means receive the modification part of said setting information when said receiving means has modification in said setting information in said master unit in a printer according to claim 1 or 2, and carries out [ that said storage control means has a modification storage control means make said setting information-storage means memorize new setting information based on said received modification part of setting information, and ] as the description.
[Claim 4] The printer characterized by having a transmitting means to transmit the modification part of the setting information concerned to the external device connected through said network when said printer is operating as said master unit and there is modification of said setting information in a printer according to claim 2.
[Claim 5] It is the printer by which it has a malfunction detection means to detect whether abnormalities occurred in said master units other than the printer concerned in a printer according to claim 2 or 4, and said decision means is characterized by setting up the printer concerned as said master unit when said abnormalities are detected.

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the updating technique of setting information required for activation of the job of two or more printers which were applied to the printer connected to networks, such as LAN (Local Area Network) and WAN (Wide Area Network), especially were connected to the network.
[0002]
[Description of the Prior Art] Conventionally, the user who purchased the printer which uses for them, carrying out direct continuation to networks, such as LAN and WAN, needed to set up the various setting information accompanying the protocol to be used or the mode in which it is made to operate, at the time of initial installation.
[0003] For example, to operate a printer on the directory service which is service of Netware 4.1J currently offered from the novel company, the object which serves each printer needs to know beforehand in which context of which tree it exists.
[0004] For this reason, the user needed to set up the tree and the context beforehand as initial setting for starting. Moreover, in printing using LPD (Line Printer Daemon), in order to recognize the printer by which a client corresponds, the user needed to set up an IP address, the Gateway address, a subnet mask, etc. beforehand.
[0005] When a user purchased 100 sets of printers in lump sum when performing these setup for example, it had to set up one almost same setup at a time to all printers, and since the man day concerning a user and a service engineer will become huge, while very much time and effort and time amount would be spent, it had also become causes, such as an input mistake.
[0006] That the above-mentioned problem should be solved, when two or more equipments are connected to the network, the approach of enabling it to distribute a program etc. automatically to all the equipments connected to the network only by installing a program in one of sets [ them ] is proposed (refer to JP,7-200509,A).
[0007] Moreover, the approach of preparing a master station and a slave station on a network, acquiring information as other approaches, in a master station, and transmitting to a slave station is proposed (refer to JP,5-081036,A).
[0008]
[Problem(s) to be Solved by the Invention] However, although time and effort and time amount were reducible about a setup in the time of purchasing equipment in lump sum first by the approach indicated by JP,7-200509,A, when adding the printer to the network afterwards, or when version up of ROM was carried out and network configuration was changed further, according to each case, it had to set up serially, and much time and effort and time amount had to be spent as a result.
[0009] Moreover, although the vicarious execution station replaced with this is searched and the management of the right of a master station is transferred to a part of slave station in the approach indicated by JP,5-081036,A when a failure occurs in a master station ** with a possibility that a master station will be absent, without a notice being impossible for a vicarious execution station, information will not be transmitted to a slave station, and no devices may stop operating when a failure arises in a communication link.
[0010] Moreover, when it was able to communicate and a vicarious execution station was not found, there was a possibility of saying that no devices will stop operating too.
[0011] Then, it is not to be based on the existence of failure generating of the equipment which is a master, but

ensure a setup while it receives common setting information from the equipment which becomes the renewal origin of setting information and performs an initial starting setup to the printer concerned automatically, without preparing especially the server used as a master, in case the 1st purpose of this invention connects a printer to a network.
[0012] Moreover, the 2nd purpose of this invention is for setting information to be made to be reflected by updating the setting information on the equipment which becomes an updating agency in all devices automatically, even when modification arises to setting information.
[0013]
[Means for Solving the Problem] In order to solve the above-mentioned technical problem, a configuration according to claim 1 A detection means to be the printer to which two or more equipments are connected through a network, and to detect whether the master unit which becomes the renewal origin of setting information required for activation of the job of said printer is connected through said network, A receiving means to receive setting information from said master unit when said master unit is detected based on the result of said detection, It is characterized by having a setting information storage means to memorize said setting information, a storage control means to make said setting information storage means memorize said setting information, and a job activation means to perform said job based on said setting information.
[0014] According to the configuration according to claim 1, a detection means detects whether the master unit which becomes the renewal origin of setting information required for activation of the job of a printer is connected through the network. Receiving setting information through a network from a master unit, when a master unit is detected based on the result of detection [ in / in a receiving means / a detection means ], a setting information storage means memorizes the setting information received under control of a storage control means. A job activation means performs a job based on the setting information memorized by the setting information storage means.
[0015] A configuration according to claim 2 is characterized in a configuration according to claim 1 by to have a decision means determine the printer concerned as a master unit which becomes the renewal origin of said setting information when said master unit is not detected based on the result of said detection, and the generation storage control means generates said setting information that it should function as said master unit based on said decision, and said setting information-storage means makes a means memorize.
[0016] According to the configuration according to claim 2, in addition to an operation of a configuration according to claim 1, a decision means determines the printer concerned as a master unit which becomes the renewal origin of setting information, when a master unit is not detected based on the result of detection of a detection means. Thereby, a generation storage control means generates setting information that it should function as a master unit based on the decision in a decision means, and a setting information storage means is made to memorize it.
[0017] A configuration according to claim 3 is set in a configuration according to claim 1 or 2. Said receiving means When said setting information in said master unit has modification, it has a modification receiving means to receive the modification part of said setting information. Said storage control means It is characterized by having a modification storage control means to make said setting information storage means memorize new setting information, based on said received modification part of setting information.
[0018] According to the configuration according to claim 3, when the modification receiving means of a receiving means has modification in the setting information in a master unit in addition to an operation of a configuration according to claim 1 or 2, the modification part of setting information is received. Thereby, the modification storage control means of a storage control means makes a setting information storage means memorize new setting information based on the received modification part of setting information.
[0019] In the configuration according to claim 2, the configuration according to claim 4 is characterized by having a transmitting means to transmit the modification part of the setting information concerned to the external device connected through said network, when said printer is operating as said master unit and there is modification of said setting information.
[0020] According to the configuration according to claim 4, a transmitting means transmits the modification part of the setting information concerned to the external device connected through the network, when the printer is operating as a master unit in addition to an operation of a configuration according to claim 2 and there is modification of setting information.

[0021] Said decision means is characterized by setting up the printer concerned as said master unit, when it has a malfunction detection means to detect whether abnormalities generated the configuration according to claim 5 in said master units other than the printer concerned in the configuration according to claim 2 or 4 and said abnormalities are detected.
[0022] According to the configuration according to claim 5, in addition to an operation of a configuration according to claim 2 or 4, a malfunction detection means detects whether abnormalities occurred in master units other than the printer concerned. Thereby, a decision means sets up the printer concerned as a master unit, when abnormalities are detected by the malfunction detection means.
[0023]
[Embodiment of the Invention] Next, the suitable operation gestalt of this invention is explained with reference to a drawing.
[1] The configuration of the 1st network system which equipped operation gestalt drawing 1 with the printer of the operation gestalt of this invention is shown. The 1st network system is equipped with the printer 103 applied to the server computer 102 and this invention which are the client computer 101 and the 2nd computer which are the 1st computer through communication link Rhine CL, and is constituted.
[0024] The hardware configuration of a printer 103 is shown in drawing 2 . CPU301 by which a printer 103 controls the whole printer, and ROM302 which stored a control program, various data, etc., The hard disk 303 for memorizing the various programs for control, and various data, RAM304 which memorizes various control programs or various data temporarily, The control panel 305 for a user to perform various actuation and the print engine 306 for performing various print jobs, such as printing of the generated bit map data, It has the LAN interface 307 which performs various interface control in a network, and is constituted in order to perform reception of the print data from other information processors, and the communication link with other information processors.
[0025] In this case, CPU301 functions as the detection means in this invention, a decision means, a storage control means, a generation storage control means, a modification storage control means, and a malfunction detection means, ROM302 functions as a setting information storage means, and the LAN interface 307 is functioning as the transmitting means in this invention, a receiving means, and a modification receiving means.
[0026] Next, with reference to drawing 1 , the actuation at the time of the 1st network connection of the printer of this operation gestalt is explained. In addition, this operation gestalt explains as an example the printer which operates on a directory service using Netware 4.1J server currently offered from the novel company.
[0027] A printer 103 communicates with other printers in a network, and an information processor, when it connects with a network at the time of installation. At this time, it detects whether there is any master printer on which the recognition means in CPU301 (refer to drawing 3 ) in a printer 103 functions as a master unit which has setting information required for starting of a self-opportunity printer outside through a network.
[0028] When the master printer which has setting information required for starting of the printer 103 concerned is found as a result of this detection, it will store in the setting information management table in ROM302 as receives that setting information with the receiving means in CPU301 and shows the received setting information to drawing 3 .
[0029] Here, a setting information management table is explained. As a setting information management table is shown in drawing 3 , as contents written in a setting information management table The network address of a master printer name and a master printer, the network address of a self-opportunity, the frame type (ETHERNET (trademark)802.3 and ETHERNET802.2 --) currently used ETHERNET II, ETHERNET SNAP, TOKEN-RING, A context, a file server name, etc. in which an object exists on the tree with which the object used in case this printer operates on a NetWare directory service exists and these trees, such as TOKEN-RING SNAP, are chosen. It is because such information turns into setting information required at the time of starting of a printer.
[0030] It cannot be overemphasized that the contents of this setting information management table are changed with the module which in LPD is used so that an IP address, the Gateway address, a subnet mask, etc. may be needed for a setting information management table as a network address.
[0031] By the way, in the case of the network system shown in drawing 1 , the printer connected to the network is only a printer 103, and CPU301 detects that a master printer does not exist.
[0032] Then, CPU301 will determine to operate the printer 103 concerned as a master printer, and a user will

set it up about the initialization information common to a printer in the network system concerned using a control panel 305, a client computer 101, or the server computer 102.
[0033] The configuration of the 2nd network system which equipped drawing 4 with the printer of the operation gestalt of this invention is shown. The 2nd network system is equipped with three sets of the printers 203-205 applied to the server computer 202 and this invention which are the client computer 201 and the 2nd computer which are the 1st computer through communication link Rhine CL, and is constituted.
[0034] Next, the actuation at the time of the 2nd network connection of the printer of this operation gestalt is explained. In the network system shown in drawing 4 , although three sets of printers 203-205 are connected to communication link Rhine CL, in the following explanation, a printer 203 is explained as a core. In addition, since it is the same as that of the configuration of the printer 103 of drawing 2 about the configuration of printers 203-205, the detailed explanation is omitted.
[0035] When a printer 203 is connected to a network at the time of installation, CPU301 of a printer 203 detects whether other printers exist in a network. And like the network system shown in drawing 4 , when a printer 204 and a printer 205 exist, it detects whether the master printer which has initialization information common to the printer connected to the network, or functions as a master unit exists.
[0036] When a master printer exists in the printer connected to the network, common initialization information is received through the LAN interface 307, and CPU301 is too registered into the setting information management table (refer to drawing 3 ) of ROM302. By this, a printer 203 will receive the print data by which will be registered, will start using initialization information, and received directly the printer data sent out from a client computer 201, or the queuing was carried out to the server computer 202, and will perform a print job based on these.
[0037] Next, drawing 5 and drawing 2 are referred to, and the actuation which shows actuation to starting at the time of the network connection of the printer of this operation gestalt is explained more to a detail. In this case, the setting information management table shown in drawing 3 shall be constituted like nonvolatile RAM, EEPROM, or a hard disk using the storage with which after power-source OFF is held. Furthermore, each of these parameters shall be constituted so that a setting change may be made from the client computer 201 grade on the control panel of an airline printer, or a network.
[0038] A printer 203 is connected to a network, and if a power source is switched on, the setting mode of the self-opportunity in the setting information management table shown in drawing 3 will be checked (step S401). In the setting mode of the printer in such a case, it is for example, ** slave printer mode (mode data = 0 default) by the value of mode data.
** Master printer mode (mode data = 1)
** Stand-alone mode (mode data = 2)
There is the mode of three **.
[0039] In a power up, it distinguishes whether the setting mode of a setting information management table is stand-alone mode (mode data = 2) (step S402). When having become mode data =2, i.e., stand-alone mode, by distinction of step S402, setting mode is set to RAM304 as stand-alone mode (step S403). Then, it moves to the input waiting of each setting information for starting as a stand-alone printer (step S404).
[0040] In the case of stand-alone mode, irrespective of the existence of the existence of other printers, there is nothing performing communication link actuation with other printers, and the printer 203 concerned needs to perform all setting information.
[0041] next, when it came out of and confirms whether the set point was inputted (step S405) and the set point is inputted, the inputted set point is set as a setting information management table (step S414), and a printer 203 is started using these set-up parameters (step S415).
[0042] When the setting mode of a setting information management table has turned into slave printer mode by distinction of step S402, the multicast packet which searches the master printer which exists on a network is sent out (step S406). When the file server holds the information on a master printer, you may ask a file server, without the ability sending out a multicast packet. In addition, these processings are performed by CPU301.
[0043] By distinction of step S402, in not being mode data !=2, i.e., stand-alone mode, it performs master printer retrieval processing in order to judge whether a master printer exists on a network (step S406). And it distinguishes whether a master printer exists on a network (step S407).
[0044] By distinction of step S407, a master printer (for example, printer 204) exists. When the response from

this master printer is received, (Step S407; Yes), It registers with a setting information management table by using the printer concerned which answered as a master printer (step S408). The setting mode of the printer 203 concerned is set as slave printer mode on RAM304 (step S409), and each setting information is acquired from a master printer (in the case of an above-mentioned example printer 204) (step S410).
[0045] Subsequently, the acquired setting information is set as a setting information management table (step S414), and the printer 203 which is self is started using such setting information (step S415).
[0046] When a master printer is not able to be discovered by step S407 field distinction, by (step S407; No) and CPU301, the setting mode of a setting information management table and the setting mode of RAM304 are set as master printer mode (step S411), shift to the input process of setting information, and will be in the state waiting for an input of setting information (step S412).
[0047] Next, it distinguishes whether setting information was inputted through the control panel 305 or client computer 201 grade of a printer 203 (step S413), when setting information is inputted, (step S413; Yes) and the inputted setting information are set as a setting information management table (step S414), and the printer 203 which is self is started using such setting information (step S415).
[0048] the case beforehand set up in the input waiting state (step S412) of setting information where setting information is not inputted even if it carried out fixed time amount progress -- (step S413; No) -- it shifts to step S401 and processing is again repeated from the check in setting mode. When fixed time setting of the setting information is not carried out in step S405 (step S405; No), it shifts to step S401 again, and processing is again repeated from the check in setting mode. When setting mode is changed at this time, it will process according to the changed mode.
[0049] Next, with reference to drawing 6 , actuation when a printer is working as after [ starting ] slave printer mode is explained. A printer shows the flow Fig. of operation which can be set working as after [ starting ] slave printer mode to drawing 6 . After starting a printer 203 as a slave printer, while it serves as waiting for data reception, a polling demand is periodically given to a master printer (step S501).
[0050] Next, it distinguishes whether a printer 203 checks the contents of a polling response, and setting information has modification (step S502). In distinction of step S502, when setting information has modification, (step S502; Yes) and a printer 203 acquire setting information (step S503), and change the contents of the setting information management table of a self-opportunity (step S504). In distinction of step S502, when there is no modification in setting information, (step S502; No) and the loop formation which shifts to step S501 and polls processing again after fixed time amount are repeated.
[0051] Next, with reference to drawing 7 , a printer explains actuation when a master printer is downed working as after [ starting ] slave printer mode. When a printer is working as after [ starting ] slave printer mode, the flow Fig. of operation showing actuation when a master printer is downed is shown in drawing 7 . While a printer 203 serves as waiting for data reception after starting it as a slave printer, a polling demand is periodically given to a master printer (step S601).
[0052] Next, it distinguishes whether a printer 203 checks the contents of the polling response to a polling demand, and has a response (step S602). In distinction of step S602, when there is no polling response, (step S602; No) and processing are again shifted to step S601, and a polling demand is again performed to a master printer.
[0053] In distinction of step S602, when there is a polling response, retrieval of (step S602; Yes) and a master printer is performed (step S603). Next, by distinction of step S604, a master printer (for example, printer 204) exists. When the response from this master printer is received, (Step S604; Yes), It registers with a setting information management table by using the printer concerned which answered as a master printer, the setting mode of the printer 203 concerned is set as slave printer mode on RAM304, and each setting information is acquired from a master printer (in the case of an above-mentioned example printer 204). Subsequently, the acquired setting information is reset on a setting information management table (step S605).
[0054] And the printer 203 which is self will be started using such setting information. When a master printer is not able to be discovered in distinction of step S604, it judges that the master printer which existed all over the network stopped existing, and in order to start a self-opportunity as a master printer, the setting mode of a setting information table is changed into master printer mode (mode data = 1) (step S606). In addition, in these processings, the processing judged that the master printer stopped existing is made by CPU301 of a printer, and in order to start a self-opportunity as a master printer, the processing which changes the setting mode of a

setting information table is too made by CPU301.
[0055] Then, after the printer of this operation gestalt starts with reference to drawing 7 , the case where it operates in master printer mode is explained. After the printer of this operation gestalt starts to drawing 7 , the flow Fig. of operation in the case of operating in master printer mode is shown.
[0056] CPU301 of a printer 203 distinguishes whether there was any change request of setting information from the client computer 201 grade on the control panel 305 of a printer 203, or a network (step S701). By distinction of step S701, when there is a change request of setting information, the contents of (step S5701; Yes) and the setting information management table are changed (step S702).
[0057] When there is no change request of setting information by distinction of step S701, (step S701; No) and a polling demand are received (step S703), and the polling response to it is transmitted (step S704). The transmission by this polling response will be made with CPU201 and the LAN interface 307 of a printer 203.
[0058] [2] Although the slave printer gave the example which holds the network address of a master printer and is polled periodically with the modification above-mentioned implementation gestalt of an operation gestalt, a master printer holds the address of a slave printer group, and only when modification is shown in the setting information management table of a master printer, you may notify to all slave printers in a multicast.
[0059] However, since a slave printer cannot be detected when such an approach is taken and a master printer is downed, only for the information processor used as a file server to hold the operating status of a master printer, and what is necessary is just made to perform the notice of a down at the time of fault generating to other slave printers.
[0060] Moreover, it is also possible to constitute so that the information processor which serves as a file server similarly may be operated as false master printer equipment and the same effectiveness may be acquired.
[0061] [3] As explained beyond the effectiveness of an operation gestalt, according to the printer concerning this operation gestalt ** Each printer connected in the first place in the network searches the master printer as a master unit. When it is going to acquire setting information and the master printer as a master unit is not detected Since the printer concerned is determined as a master unit which becomes the renewal origin of setting information Without the fault of being unable to perform a setup of the setting information by a master unit not existing occurring, a setup of setting information does not need to become possible easily and certainly, and it is not necessary to input required setting information for every set like before. Therefore, when there are many printers, drastic reduction of the man day concerning a user and a service engineer is attained.
[0062] When the setting information in the master printer as a master unit has modification, moreover, other printers By receiving the modification part of setting information, and constituting so that renewal of setting information may be aimed at Even when an installation environment is changed, the setting information on all the equipments on a network can be updated only by changing only a setup of the master printer as a master unit, and the time and effort concerning installation of a user and a service engineer can be saved.
[0063] Even when an installation environment is changed by constituting so that the modification part of setting information may be transmitted when setting information is changed in the master printer which is furthermore a master unit, the setting information on all the equipments on a network can be updated only by changing only a setup of the master printer which is a master unit, and the time and effort concerning installation of a user and a service engineer can be saved.
[0064] ** Only by installing a program in one of two or more equipments which were indicated [ second ] by JP,7-200509,A and which were connected to the network In the approach of enabling it to distribute a program etc. automatically to all the equipments connected to the network When adding the equipment which carried out additional purchase later to the network, or when version up of ROM was carried out and network configuration was changed further, according to each case, it had to set up serially, and much time and effort and time amount had to be spent as a result.
[0065] However, when according to this operation gestalt a printer is newly added or the version of ROM is changed When the printer used as the master unit which retrieves setting information respectively and becomes the renewal origin of setting information required for activation of the job of a printer is detected, a printer Since setting information is received through a network from the printer which functions as the master unit concerned and setting information is memorized Only by setting up by using as a master unit the first printer connected to the network, when connecting two or more printers to a network Initial setting can be automatically performed only by connecting with a network about the printer after the 2nd set, and switching on

a power source, the time and effort concerning installation of a user and a service engineer can be saved, and it becomes possible to perform a job easily.
[0066] When the setting information in the master printer as a master unit has modification, moreover, other printers By receiving the modification part of setting information, and constituting so that renewal of setting information may be aimed at Even when an installation environment is changed, the setting information on all the equipments on a network can be updated only by changing only a setup of the master printer as a master unit, and the time and effort concerning installation of a user and a service engineer can be saved.
[0067] ** Prepare a master station and a slave station on a network as indicated [ third ] by JP,5-081036,A. When information is acquired in a master station, there is the approach of transmitting to a slave station and a failure arises in a communication link in this approach A master station will be in an absent condition, without the ability notifying to the vicarious execution station to which the management of the right of a master station should be transferred, and there is a possibility that information will not be transmitted to a slave station and no devices may stop operating. Moreover, when it was able to communicate and a vicarious execution station was not found, there was a possibility of saying that no devices will stop operating too.
[0068] However, the printer which exist when the printer of this operation gestalt is used searches a master printer uniquely respectively, communication link impossible etc. occurs in a master printer, and when the abnormalities of a master printer not existing are detected, that it should operate as a master printer, oneself can set up the printer concerned as a master unit, and can demand the input of setting information from a user.
[0069] Consequently, a setup of the setting information by a master unit stopping existing suddenly according to the fault of communication link Rhine etc. cannot be performed, or the situation of no devices stopping operating like before becomes possible [ avoiding ], and a setup of setting information becomes possible easily and certainly.
[0070]
[Effect of the Invention] Only by setting up by using as a master unit the first printer connected to the network, when connecting two or more printers to a network according to this invention, initial setting can be automatically performed only by connecting with a network about the printer after the 2nd set, and switching on a power source, the time and effort concerning installation of a user and a service engineer can be saved, and it becomes possible to perform a job easily.
[0071] Moreover, only by an installation environment being changed and changing into the setting information on one as a master unit of printers, after connecting two or more printers to a network according to this invention Since each of other printer can receive the modification part of setting information and renewal of setting information can be aimed at Even when an installation environment is changed, the setting information on all the equipments on a network can be updated only by changing only a setup of a master unit, and the time and effort concerning installation of a user and a service engineer can be saved.

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DRAWINGS

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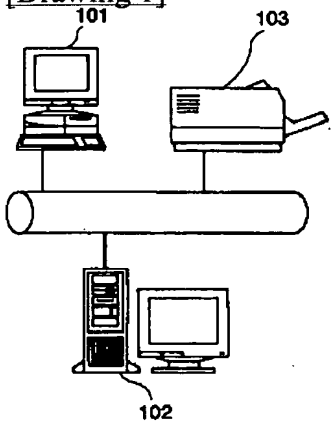
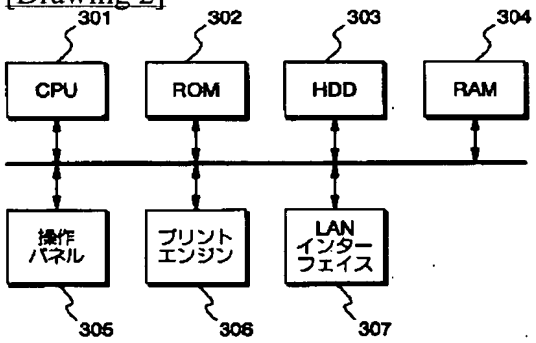
[Drawing 1]



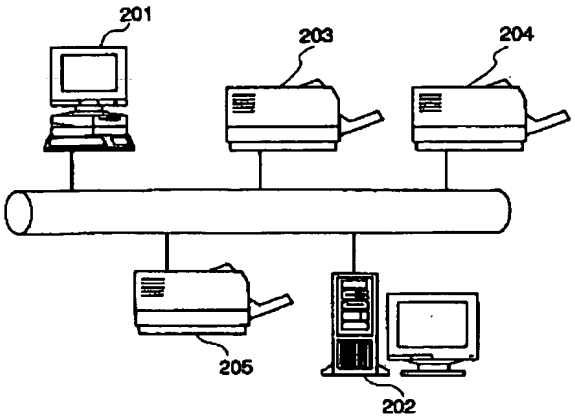

[Drawing 2]



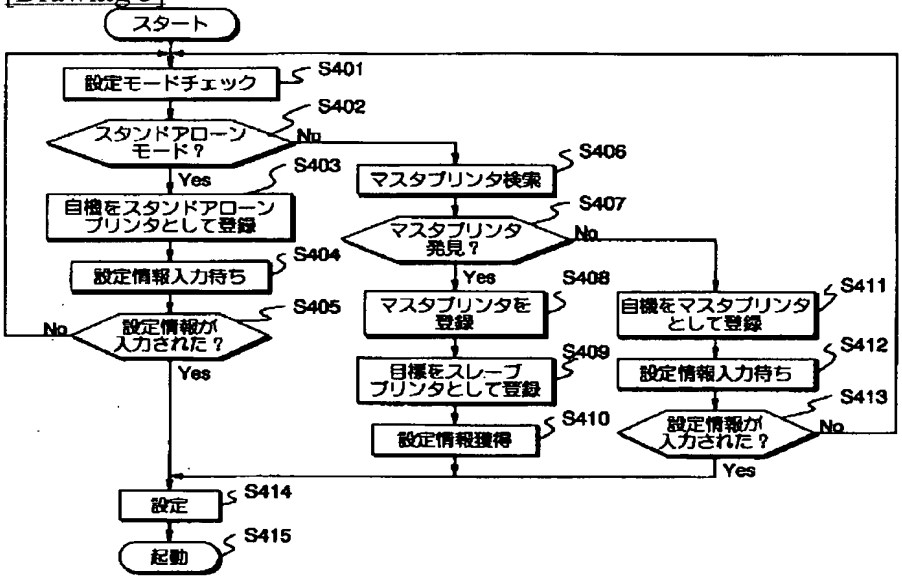

| 設定パラメータ | 値 |
|---|---|
| 設定モード | 0（スレーブモード） |
| マスタプリンタ | FXMasterPrinter |
| ネットワークアドレス（マスタプリンタ） | 00001000:080037012345:4000 |
| ネットワークアドレス（自機プリンタ） | 00001000:080087128458:4000 |
| フレームタイプ | 2××××_II) |
| ツリー | ××× |
| コンテキスト | KANAGAWA |
| ファイルサーバ名 | FXSERVER |

[Drawing 3]

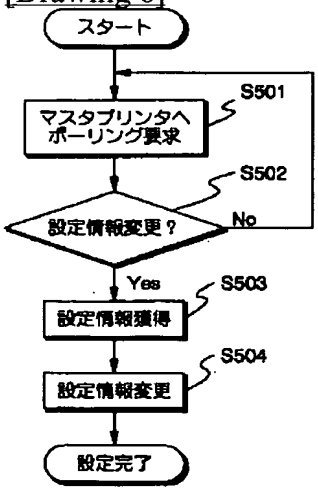
[Drawing 4]



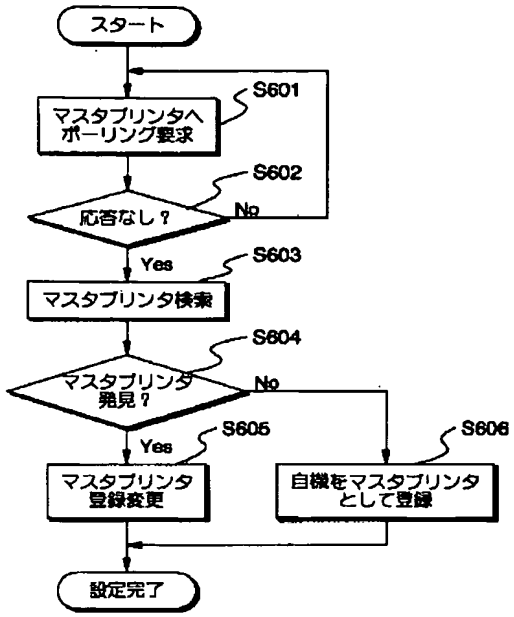

[Drawing 5]



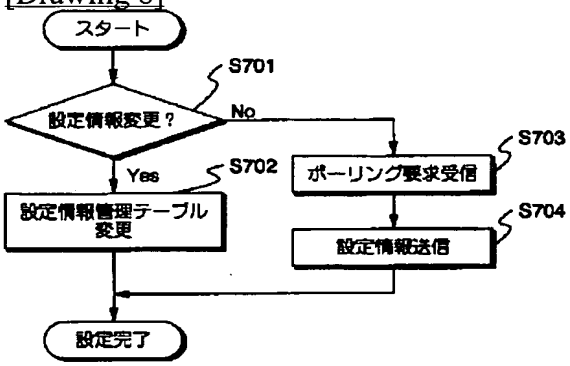

[Drawing 6]




[Drawing 7]




[Drawing 8]

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[Translation done.]